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Specific Gravity and Shrinkage of *Elaeocarpus joga* Wood from Guam

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ABSTRACT: With a specific gravity of 0.43 and a characteristic of low shrinkage, this hardwood has excellent potential as a general utility wood for local use on Guam. It shrinks less in drying than any commonly used hardwood of the United States.

RETRIEVAL TERMS: *Eleaocarpus joga*; specific gravity; wood shrinkage; wood characteristics; wood properties; Guam.

OXFORD: 176.1 *Elaeocarpus joga*:(967) [--812:812.31:812.214:812.8]

Elaeocarpus joga Merr. is a fairly abundant tree species on limestone soils in the forests of Guam. It is not outstanding as a potential timber tree, but is one of two trees native to Guam that attains a form and diameter suitable for economic conversion into lumber. The other species is *Premna integrifolia* Linne, known in Guam as false elder.

In cooperation with the Department of Agriculture of the Government of Guam, we made a limited evaluation of the wood of *Elaeocarpus joga*. We measured the specific gravity and shrinkage of the wood and observed its behavior during machining and drying.

The Department of Agriculture of Guam logged and shipped us the sample: five bolts, each 4 feet long and 10 to 13 inches in diameter inside the bark. Each bolt was cut from the butt log of a different tree. All trees were growing in the northern part of Guam. Their age was unknown.

At felling each tree contained some butt rot near the pith. Two of the bolts shipped had 2-inch diameter cores of decay surrounding the pith.

Two cross sections--2 inches thick and 7 inches thick--were bucked from the central portion of each bolt and from these standard 1- by 1- by 4-inch and 2- by 2- by 6-inch shrinkage and specific gravity samples were prepared. Each tree was represented by four radial shrinkage, four tangential shrinkage, and four specific gravity-volumetric shrinkage specimens.

Results

Mean values for the properties measured were as follows:

Moisture content, unseasoned.....Pct.	73.9
Specific gravity, unseasoned volume, ovendry weight.....	0.433
Density, air-dry, volume and weight at 11.8 Pct. moisture content.....lbs./cu.ft.	32.0
Shrinkage:	
Radial, unseasoned to air-dry (11.2 Pct. M.C.).....Pct.	1.4
Radial, unseasoned to ovendry...Pct.	2.75
Tangential, unseasoned to air-dry (11.4 Pct. M.C.).....Pct.	3.2
Tangential, unseasoned to ovendry.....Pct.	5.5
Volumetric, unseasoned to air-dry (11.8 Pct. M.C.).....Pct.	5.7
Volumetric, unseasoned to ovendry.....Pct.	9.25

Four of the five bolts contained heartwood, which was pale brown in color in the unseasoned condition and faded to a light straw color after drying. The sapwood in these four bolts was white and averaged 3-inches in width. The three bolts not showing any visible decay had a 2- to 3-inch diameter area of brittleheart surrounding the pith.

The wood was of moderately fine texture, straight grained, and lustrous

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on planed surfaces. It was easy to work--sawing and planing easily and cleanly when green. The air-dried wood was easily dented with a fingernail. In drying, the wood tended to surface check on the tangential faces and end check along the rays. This checking, however, was not serious.

Comparison With Other Woods

Of the 120 or so species of *Elaeocarpus* in the world, the one most widely known and used is *Elaeocarpus grandis* F. v. Muell., silver quandong, of Australia. This wood has a specific gravity of 0.394, an air dry density of 29.3 lbs. per cubic foot, and a radial and tangential shrinkage (unseasoned to air-dry) of 1.4 percent and 4.3 percent, respectively.[1]

Since the wood from Guam has a slightly higher specific gravity, it should be stronger than the Australian wood. And because of its lower tangential shrinkage, *Elaeocarpus joga* should season better and remain fairly stable with moisture changes.

Elaeocarpus joga shrinks less in drying than any commonly used hardwood of the United States. It compares in shrinkage with some of the more stable U.S. softwoods, such as Alaska-cedar (*Chamaecyparis nootkatensis*), Eastern white pine (*Pinus strobus*), and sugar pine (*Pinus lambertiana*). Considering its specific gravity and the strength properties of the closely related silver quandong,[2] *Elaeocarpus joga* should compare in most strength properties to red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), silver maple (*Acer saccharinum*), and yellow-poplar (*Liriodendron tulipifera*).

Uses

Elaeocarpus joga should be suitable for many of the same uses as the U.S. hardwoods. Such uses would include interior furniture parts, such as drawer sides and backs and upholstery frames. The wood will probably lend itself to steam bending as well as does silver quandong.[3] With suitable finishing, it could be suitable for interior trim, but it is not naturally an attractively figured or colored wood. It should be well suited for boxes and crates and light weight pallets.

The relatively small diameter of the logs available on Guam limits use of this species for veneer. But the logs should provide an excellent utility hardwood when sawed into lumber.

[1] Kingston, R. S. T., and Risdon, C. V. E. *Shrinkage and density of Australian and other south-west Pacific woods.* C. S. I. R. O. Melbourne. Tech. Pap. 13 p. 45. 1961.

[2] Bolza, E., and Kloot, N. H. *The mechanical properties of 174 Australian timbers.* C. S. I. R. O., Tech. Paper 25. pp. 86-89. 1963.

[3] Boas, I. H. *The commercial timbers of Australia, their properties and uses.* Commonwealth of Australia, Council for Scientific and Industrial Research, Melbourne. pp. 230-231, illus. 1947.

The Author

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